

at least two electric windings that generate said flux, wherein said at least two electric windings including

an electric conductor,

a first semiconducting layer configured to surround said electric conductor,

an insulating layer configured to surround said first semiconducting layer, and

a second semiconducting layer configured to surround said insulating layer,

wherein said rotating electric machine being configured to be directly connected to at least one of a distribution network and a transmission network.

34. The system according to claim 33, wherein a potential of said first semiconducting layer being substantially equal to a potential of said electric conductor.

35. The system according to claim 33, wherein said second semiconducting layer being configured to form a substantially equipotential surface surrounding said electric conductor.

36. The system according to claim 35, wherein said second semiconducting layer being connected to a node at a predetermined potential.

37. The system according to claim 36, wherein said predetermined potential being a ground potential.

38. The system according to claim 33, wherein at least two adjacent layers of said at least two electric windings of said rotating electric machine having a substantially identical coefficient of thermal expansion.

39. The system according to claim 33, wherein said electric conductor further comprises a plurality of strands and at least two strands of said plurality of strands being in electric contact.

40. The system according to claim 33, wherein said first semiconducting layer, said insulating layer, and said second semiconducting layer being secured to at least one adjacent layer selected from a set of said first semiconducting layer, said second insulating layer, and said second semiconducting layer along a substantially whole contact surface.

41. A system configured to adapt a speed of a rotating electric machine in said system, wherein said rotating electric machine being directly connected to at least one of a distribution network and a transmission network, said system comprising:

a stator and air gap, in which flux is generated, said flux having at least two vectorial quantities; and

at least two electric windings, including

a high-voltage cable, including,

a current-carrying conductor comprised of a plurality of strands,

a first semiconducting layer arranged around said current-carrying conductor,

an insulating layer of a solid insulating material arranged around said first semiconducting layer, and

a second semiconducting layer arranged around the insulating layer.

42. The system according to claim 41, wherein said high-voltage cable being flexible.

43. The system according to claim 42, wherein said first semiconducting layer, said insulating layer, and said second semiconducting layer being arranged to adhere to at least one other layer selected from a set of said first semiconducting layer, said insulating layer, and said second semiconducting layer when said high-voltage cable is bent.

44. The system according to claim 41, wherein said rotating electric machine comprises:

an extra winding arranged on a stator of said rotating electric machine; and

a magnetization apparatus connected to said rotating electric machine;

wherein a first flux vector of said at least two vectorial quantities being generated via said extra winding and said magnetization apparatus and a second flux vector of said at least two vectorial quantities being generated via said at least two electric windings.

45. The system according to claim 44, wherein said magnetization apparatus being a first frequency converter.

46. The system according to claim 45, wherein said system further comprises an auxiliary feeder connected to said first frequency converter and said rotating electric machine.

47. The system according to claim 46, wherein:

said rotating electric machine being an asynchronous rotor; and

said auxiliary feeder comprising a stator winding and a permanent magnet rotor connected to said asynchronous rotor.

48. The system according to claim 46, further comprising:

a transformer connected to said first frequency converter and said auxiliary feeder,

said transformer being connected to a distribution busbar via a first circuit breaker; and

a second frequency converter connected to said transformer and connected to said distribution busbar via a second circuit breaker.

49. The system according to claim 33, wherein:

said at least two electric windings being flexible; and

Al
Cont.

said first semiconducting layer, said insulating layer, and said second semiconducting layer making contact with at least one neighboring layer selected from a set of said first semiconducting layer, said insulating layer, and said second semiconducting layer.

Sub
B3
Cont.

50. The system according to claim 49, wherein said first semiconducting layer, said insulating layer, and said second semiconducting layer being made of a plurality of materials with a plurality of elasticities and a plurality of coefficients of thermal expansion configured to absorb volume changes of said first semiconducting layer, said insulating layer, and said second semiconducting layer caused by a temperature variation during an operation such that said first semiconducting layer, said insulating layer, and said second semiconducting layer remain in contact with one another over an operational temperature range.

51. The system according to claim 50, wherein the plurality of materials in said first semiconducting layer, said insulating layer, and said second semiconducting layer having a plurality of high elasticities.

52. The system according to claim 50, wherein said first semiconducting layer and said second semiconducting layer being configured to form substantially equipotential surfaces.

53. A method for speed control of a rotating electric machine configured to be directly connected to a distribution network, comprising:

generating at least two vectorial quantities which constitute a resultant flux of said rotating electric machine during an operation, wherein said rotating electric machine having at least two electric windings, each winding including

at least one electric conductor,

a first semiconducting layer arranged surrounding said electric conductor,

an insulating layer surrounding said first semiconducting layer, and
a second semiconducting layer arranged surrounding said insulating layer.

54. A method for speed control of a rotating electric machine configured to be directly connected to a distribution network and having at least two electric windings formed from a high-voltage cable including at least one current-carrying conductor wherein said at least one current-carrying conductor exhibits a plurality of strands, a first semiconducting layer arranged around said at least one current-carrying conductor, an insulating layer made of a solid insulating material arranged around said first semiconducting layer, and a second semiconducting layer arranged around said insulating layer, said method comprising the step of:

generating at least two vectorial quantities that form a resultant flux of said rotating electric machine during an operation.

55. The method according to claim 53, further comprising the step of:

controlling a phase position as well as an amplitude and a speed of rotation relative to another flux generated by said distribution network of at least one first vectorial quantity of said at least two vectorial quantities.

56. The method according to claim 54, further comprising the step of:

controlling a phase position as well as an amplitude and a speed of rotation relative to a flux generated by said distribution network of at least one first vectorial quantity of said at least two vectorial quantities.

57. The method according to claim 55, wherein said step of controlling further comprises the steps of:

a1
cont.

generating said at least one first vectorial quantity of said at least two vectorial quantities via an extra winding mounted on said rotating electric machine and magnetization equipment connected to said rotating electric machine; and

generating at least one second vectorial quantity of said at least two vectorial quantities via an ordinary winding of said rotating electric machine.

58. The method according to claim 57, wherein said step of controlling further comprises:

setting a speed of said rotating electric machine in a generator operating mode;

wherein said rotating electric machine having an asynchronous rotor.

59. The method according to claim 57, wherein said step of controlling further comprises:

setting a speed of said rotating electric machine in a motor operating mode;

wherein said rotating electric machine having an asynchronous rotor.

60. The method according to claim 57, wherein said step of controlling further comprises:

damping a harmonic content of a stator voltage in said ordinary winding of said rotating electric machine.

61. The method according to claim 57, wherein said step of generating said at least one first vectorial quantity comprises:

injecting a reactive magnetization current via said extra winding sufficient to control a voltage of said rotating electric machine on said ordinary winding of said rotating electric machine in at least one of a rotating electric machine connected to a main power terminal and a rotating electric machine not connected to a main power terminal.

62. The method according to claim 58, wherein said rotating electric machine having a permanent magnet rotor connected to said asynchronous rotor and being configured to generate a magnetization current and an other auxiliary power.

63. The method according to claim 58, further comprising:
generating a magnetization current and an other auxiliary power with a permanent magnet rotor connected to said asynchronous rotor

64. The method according to claim 55, further comprising:
switching interruption-free between a generator operating mode and a motor operating mode.

65. The method according to claim 53, wherein
said at least two vectorial quantities being a rotating flux on a stator side of said rotating electric machine F_1 and a flux generated by a rotor current F_2 that together provide a resultant flux F in said rotating electric machine as given by

$$F = F_1 + F_2 \quad ; \text{ and}$$

said rotating flux on a stator side of said rotating electric machine F_1 is equal to a sum of a rotating flux generated by both a current in an ordinary winding $F_{1stator}$ with a speed of rotation dependent on a frequency of said distribution network and a number of pole pairs in said rotating electric machine, and a rotating flux generated by the current in an extra winding F_{1magn} controllable with respect to a phase position as well as an amplitude and a frequency relative to a flux vector of the ordinary winding as expressed by

$$F_1 = F_{1magn} + F_{1stator} .$$

66. The method according to claim 53, further comprising:

cancel
controlling said at least two vectorial quantities in said rotating electric machine using a relative phase position as well as a relative amplitude value between an active current value and a reactive current value of an ordinary winding and an extra winding.

67. A system configured to adapt a speed of a rotating electric machine included in the system, comprising:

means for generating a flux composed of at least two vectorial quantities for said rotating electric machine during an operation of said rotating electric machine; and

at least two electric windings, wherein said at least two electric windings include;

means for conducting electricity,

means for connecting a semiconductor to said means for conducting electricity,

means for insulating means for connecting, and

means for creating an equipotential surface around said means for insulating,

wherein said rotating electric machine being configured to be directly connected to a distribution network.--

REMARKS

Favorable consideration of this Application as presently amended is respectfully requested.

Claims 33-67 are active in the present Application; Claims 1-32 having been canceled and Claims 33-67 added by way of the present Preliminary Amendment. The new claims have been added to draft the canceled claims in a manner consistent with U.S. practice. It is therefore believed that no issues of new matter have been raised.